

CLAIMS

1. A recording method for recording a real time file including real time data to a disk-shaped information recording medium so that the real time data can be continuously reproduced while the real time data is reproduced according to a standard reproduction model, wherein:

the standard reproduction model includes a pickup that reads the real time data from the disk-shaped information recording medium, a buffer memory that temporarily stores the real time data read by the pickup, and a decoding module that reads the real time data from the buffer memory and processes the read real time data, and

access performance of the standard reproduction model is provided by the following formula,

$$T_{acc} = A \cdot dN + T_{rev} + B$$

where T_{acc} is an access time that is a time required for the pickup to move from one area to another area, dN is a difference in rotational speed of the disk-shaped information recording medium before and after the movement of the pickup, T_{rev} is a rotation waiting time at a target access position, A and B are constants;

the recording method comprises the steps of

searching, from a plurality of logically continuous unused areas in the disk-shaped information recording medium, an area, as a data recording area, that satisfies a real time reproducing condition which is a reproducing condition to prevent underflow during data reproduction operation, the real time reproducing condition being determined based on the access performance of the standard reproduction model, and

recording the real time data to the searched data

recording area.

2. A information recording apparatus for recording a real time file including real time data to a disk-shaped information recording medium so that the real time data can be continuously reproduced while the real time data is reproduced according to a standard reproduction model, wherein:

the standard reproduction model includes a pickup that reads the real time data from the disk-shaped information recording medium, a buffer memory that temporarily stores the real time data read by the pickup, and a decoding module that reads the real time data from the buffer memory and processes the read real time data, and

access performance of the standard reproduction model is provided by the following formula,

$$T_{acc} = A \cdot dN + T_{rev} + B$$

where T_{acc} is an access time that is a time required for the pickup to move from one area to another area, dN is a difference in rotational speed of the disk-shaped information recording medium before and after the movement of the pickup, T_{rev} is a rotation waiting time at a target access position, A and B are constants;

the apparatus comprises

a section operable to search, from a plurality of logically continuous unused areas in the disk-shaped information recording medium, an area, as a data recording area, that satisfies a real time reproducing condition which is a reproducing condition to prevent underflow during data reproduction operation, the real time reproducing condition being determined based on the access performance of the standard reproduction model, and

a section operable to record the real time data to the

searched data recording area.

3. A reproducing method for reproducing real time data from a disk-shaped information recording medium, the disk-shaped information recording medium being recorded with a real time file including the real time data so that the real time data can be continuously reproduced while the real time data is reproduced according to a standard reproduction model, wherein:

the standard reproduction model includes a pickup that reads the real time data from the disk-shaped information recording medium, a buffer memory that temporarily stores the real time data read by the pickup, and a decoding module that reads the real time data from the buffer memory and processes the read real time data, and

access performance of the standard reproduction model is provided by the following formula,

$$T_{acc} = A \cdot dN + T_{rev} + B$$

where T_{acc} is an access time that is a time required for the pickup to move from one area to another area, dN is a difference in rotational speed of the disk-shaped information recording medium before and after the movement of the pickup, T_{rev} is a rotation waiting time at a target access position, A and B are constants;

the reproducing method comprises the steps of

reading the real time data from the disk-shaped information recording medium,

storing temporarily the read real time data to the buffer memory,

reading the real time data stored in the buffer memory and decoding the read real time data by the decoder, and

after completion of access to previous real time

data, accessing the next real time data within the access time T_{acc} .

4. A reproducing apparatus for reproducing real time data from a disk-shaped information recording medium, the disk-shaped information recording medium being recorded with a real time file including the real time data so that the real time data can be continuously reproduced while the real time data is reproduced according to a standard reproduction model, wherein:

the standard reproduction model includes a pickup that reads the real time data from the disk-shaped information recording medium, a buffer memory that temporarily stores the real time data read by the pickup, and a decoding module that reads the real time data from the buffer memory and processes the read real time data, and

access performance of the standard reproduction model is provided by the following formula,

$$T_{acc} = A \cdot dN + T_{rev} + B$$

where T_{acc} is an access time that is a time required for the pickup to move from one area to another area, dN is a difference in rotational speed of the disk-shaped information recording medium before and after the movement of the pickup, T_{rev} is a rotation waiting time at a target access position, A and B are constants;

the reproducing apparatus comprises

a data reproducing section operable to read the real time data from the disk-shaped information recording medium,

a buffer memory operable to store temporarily the read real time data, and

a decoder operable to read the real time data stored in the buffer memory and decode the read real time data, and

the data reproducing section, after completion of access

to previous real time data, accesses the next real time data within the access time T_{acc} .

5. A disk-shaped information recording medium to which a
 5 real time file including the real time data is recorded so that the real time data can be continuously reproduced when the real time data is reproduced according to a standard reproduction model, wherein:

10 the standard reproduction model includes a pickup that reads the real time data from the disk-shaped information recording medium, a buffer memory that temporarily stores the real time data read by the pickup, and a decoding module that reads the real time data from the buffer memory and processes the read real time data, and

15 access performance of the standard reproduction model is provided by the following formula,

$$T_{acc} = A \cdot dN + T_{rev} + B$$

20 where T_{acc} is an access time that is a time required for the pickup to move from one area to another area, dN is a difference in rotational speed of the disk-shaped information recording medium before and after the movement of the pickup, T_{rev} is a rotation waiting time at a target access position, A and B are constants; and

25 the real time data is recorded on an area, in a plurality of logically continuous unused areas in the disk-shaped information recording medium, that satisfies a real time reproducing condition which is a reproducing condition to prevent underflow during the data reproduction operation, the real time reproducing condition being determined based on the access performance of the standard reproduction model.